

Restoration and recovery of native Olympia oysters in the South Slough estuary, Oregon

Project Title:

A collaborative approach to address reproduction, larval supplies, and settlement during recovery of native Olympia oysters

Location:

Coos Bay, Oregon

Goal:

Generate new science to support development of a conservation and recovery plan for Olympia oyster populations throughout Coos Bay

Partners:

Oregon Institute of Marine Biology; South Slough National Estuarine Research Reserve; Oregon State University; Oregon Sea Grant; Oregon Department of Fish and Wildlife

Timeline:

Nov 2011 to Sep 2013

Native oysters, native Americans, and early settlers:

Olympia oysters (*Ostrea lurida*) were once important members of ecological communities in many Pacific northwest estuaries. The multi-generational clusters of oysters provided multiple benefits including stabilization of soft sediments, biofiltration of the water column, and diverse habitat for benthic invertebrates and fish. Large deposits of Olympia oyster shells buried in the subtidal zone of Coos Bay indicate that the oysters were historically abundant.

Olympia oysters



Substantial populations of Olympia oysters occurred in the past within three Oregon estuaries: Netarts Bay, Yaquina Bay, and Coos Bay. Indigenous people who lived along the shoreline of these estuaries harvested the oysters, and the small bivalves were a supplemental source of food. The shells of Olympia oysters have been identified as a minor component of kitchen middens located near historic villages. It is likely that the oysters were collected at low tides and from the shallow channels, and then returned to the village site for processing and cooking.

Disappearance of Olympia oysters from Coos Bay:

Olympia oysters disappeared from Coos Bay prior to the arrival of western Europeans, most likely due to burial by fine sediments. Input of sediments into the tidal basin is attributed to widespread fires, subsidence associated with a large-scale earthquake, and the most recent tsunami of 1700.

Localized disappearance from Coos Bay is curious because the populations persisted in other Oregon estuaries. Olympia oysters currently occur in intertidal and subtidal habitats in British Columbia, the Salish Sea, Grays Harbor, Willapa Bay (WA), Netarts Bay, Yaquina Bay, Coos Bay (OR), and Humboldt Bay (CA).



“Although the local population of Olympia oysters was largely eliminated from Coos Bay due to a natural event, subsequent human activities such as dredging and shoreline alteration have presented a significant hurdle to recovery. Restoration and enhancement activities are needed to speed the recovery of Olympia oysters in Coos Bay.”

Stakeholder Involvement:

Stakeholders participate as members of the Olympia Oyster Recovery Advisory Committee. Input and issues raised by the stakeholder committee are used to help direct and guide the scientific work completed by graduate students and faculty at the Oregon Institute of Marine Biology.

Support:

Financial support for the project is provided by a grant from the NOAA-NERRS Science Collaborative.

Learn More:

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Shell deposits indicate that Olympia oysters were once abundant in Coos Bay:

Large deposits of Olympia oyster shells are buried within dredge materials along the shoreline of Coos Bay. These shell deposits indicate that the oysters were historically abundant and that they once contributed significantly to the structure and ecological dynamics of the bottom communities. Olympia oysters were inadvertently re-introduced back into Coos Bay during mariculture transport of Pacific oysters (*Crassostrea gigas*) from Willapa Bay, WA in the 1940s.

Coos Bay natural recruits



Willapa Bay hatchery cultch



Common-garden approach to restore oyster populations:

DNA analysis revealed that the genetic signature of local Olympia oysters from Coos Bay is nearly identical to distant populations from Willapa Bay. A common-garden approach was followed in 2008-09 to obtain tiny oysters from Coos Bay (natural recruits) and Willapa Bay (hatchery cultch). Onion bags filled with shells of Pacific oysters were deployed in Coos Bay as settlement sites for Olympia oyster larvae. The tiny oysters were out-planted side by side in mesh bags, and monitored for survival and growth.

Improved ecological performance of local oysters:

Faster growth rates and increased survival were observed for the local Olympia oysters that originated in Coos Bay. Although the hatchery-reared juveniles were initially larger than the natural recruits, the local juveniles surpassed the hatchery oysters in shell length after the first year of growth. Based on these results, we adopted a restoration strategy that includes periodic import of hatchery-reared cultch along with genetic enhancement by the local recruits.

